

MODULE OUTLINE

1. GENERAL

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| UNIVERSITY | UNIVERSITY OF THESSALY | | |
| SCHOOL | SCHOOL OF TECHNOLOGY | | |
| DEPARTMENT | FORESTRY, WOOD SCIENCES & DESIGN | | |
| LEVEL | UNDERGRADUATE | | |
| MODULE'S CODE | ΔΠΕ891 | SEMESTER | 8 th |
| MODULE TITLE | RENEWABLE ENERGY RESOURCES | | |
| TEACHING ACTIVITIES | | WEEKLY TEACHING HOURS | CREDITS |
| THEORETICAL PART | | 2 | 3 |
| TUTORIALS | | 1 | 2 |
| LABORATORY | | | |
| TOTAL | | 3 | 5 |
| TYPE OF MODULE | Scientific | | |
| PREREQUISITE MODULES: | NO | | |
| LANGUAGE OF TEACHING and EXAMINATIONS: | GREEK & ENGLISH | | |
| THE COURSE IS OFFERED TO ERASMUS STUDENTS | YES | | |
| MODULE'S URL | MATERIAL IS CURRENTLY UPLOADED (NEW MODULE) | | |

2. LEARNING OUTCOMES

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| LEARNING OUTCOMES |
| <p>The aim of the module is for the students to get to know the existing technologies in the field of renewable forms of energy in relation to the natural resources included in the general framework of the department (water, land-forest, sun, air) and to be able to have a general understanding of the selection of an appropriate solution in relation to the resource to be managed.</p> <p>Upon successful completion of the course, the student will be able to:</p> <ul style="list-style-type: none"> • To know the role of the environment and the possibilities of using and reusing natural resources in a sustainable way and with respect for the planet. • Understand the change in natural resource use and impacts on all systems over the last century. • To know the main sources from which energy can be produced Water (sea, lakes, rivers) air, sun, earth (forest). • To know the measures to protect wooden structures from a fire, as well as the behaviour of wooden buildings in an earthquake. • To know the technologies used for each resource separately and to be able to recognize and calculate the effect of each one on the energy footprint. • To see solutions through the application of proper management of renewable energy sources and the possibilities of utilizing energy sources based on today's needs. • To know the existing legislation and the trends of international organisations, and states regarding incentives for the use of renewable energy sources. • To understand the value of these with examples of "good practices" within Greece and internationally with the presentation of case studies. |
| SKILLS |
| <ul style="list-style-type: none"> • Search, analyse and synthesis of data and information, using appropriate technologies • Design and management of products & services |

- Decision making
- Teamwork, coordination of actions
- Critical perception and flexibility of actions
- Promotion of free, creative and inductive thinking

3. MODULE CONTENT

In the theoretical part of the module, the student learns about modern technologies of Renewable Energy Sources having a comprehensive view of solar energy, wind energy, biomass, geothermal energy, hydroelectric energy and energy from seas and other water bodies.

The course structure has the following format, presenting the technologies separately.

1. Energy reserves, the current situation – the necessity of RES.
2. Sustainability & climate change
3. list of possible topics related to the subject matter of the course and students are asked (optionally) to choose a topic for the work
4. Thermal and solar systems
5. Photovoltaic systems
6. Hydroelectric systems
7. Wind systems
8. Energy from biomass
9. Energy from agricultural and forest residues
10. Geothermal systems
11. Energy from water (waves)
12. Life cycle analysis (LCA) of RES systems
13. RETScreen software
14. Presentation of work - discussion

Attending the laboratory is mandatory for 80% of the hours. Students in groups of 3-4 prepare coursework on one of the thematic units that they have discussed with the teacher. The oral support of the tasks is an element of the laboratory assessment.

4. TEACHING AND LEARNING METHODS - ASSESSMENT

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| DELIVERY METHOD | In-class – physical presence |
| USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES | <ul style="list-style-type: none"> • Use of H/Y, ppt slides, projector, and video projection. |

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| | <ul style="list-style-type: none"> Learning process support through the e-class electronic platform | |
| TEACHING ORGANISATION | ACTIVITY | Semester Workload |
| | Theory lectures, video screenings related to the subject | 20 |
| | Presentations of work - discussion | 20 |
| | Laboratory training | - |
| | Educational visits/ individual practice tasks | 40 |
| | Study | 40 |
| | Total Module (20 workload hours per credit unit) | 120 |
| EVALUATION OF STUDENTS | <p>I. Presentation and project exam (50%) which includes: - Presentation of the project which has been assigned to the students</p> <p>II. Written or oral final exam (50%) which includes: - Short answer questions from all teaching material and carried out.</p> | |

5. RECOMMENDED-BIBLIOGRAPHY

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- Renewable Energy Technologies, Jean-Claude Sabonnadiere, ISBN: 978-1-84821-135-3, 477 pages, July 2009, Wiley-ISTE
- Renewable Energy, Technology, Economics and Environment, Editors: Kaltschmitt, Martin, Streicher, Wolfgang, Wiese, Andreas (Eds.) , ISBN 978-3-540-70949-7, 2007, XXXII, 564 p.
- Advanced Renewable Energy Sources: RSC , Gopal Nath Tiwari, Rajeev Kumar Mishra, 562 pages, Publisher: Royal Society of Chemistry (November 25, 2011)
- www.cres.gr